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30	BRS	3	((("5640487") or ("6236964") or ("6272242") or ("6314400")).PN.) and class	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2004/07/30 19:04			0
31	IS&R	17	(("4227176") or ("4736429") or ("4903305") or ("4975959") or ("4980918") or ("4985924") or ("5075896") or ("5131043")).PN.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2004/07/30 19:06			0
32	BRS	3	((("4227176") or ("4736429") or ("4903305") or ("4975959") or ("4980918") or ("4985924") or ("5075896") or ("5131043")).PN.) and index$3	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2004/07/30 19:07			0
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1 Open-vocabulary speech indexing for voice and video mail retrieval
M. G. Brown, J. T. Foote, G. J. F. Jones, K. Spärck Jones, S. J. Young
February 1997 **Proceedings of the fourth ACM international conference on Multimedia**
Full text available: pdf(1.82 MB) Additional Information: full citation, references, citings, index terms

Keywords: audio indexing, browsing, content-based retrieval, information retrieval, speech recognition, word spotting

2 Retrieving spoken documents by combining multiple index sources
G. J. F. Jones, J. T. Foote, K. Spärck Jones, S. J. Young
August 1996 **Proceedings of the 19th annual international ACM SIGIR conference on Research and development in information retrieval**
Full text available: pdf(1.12 MB) Additional Information: full citation, references, citings, index terms

3 Indexing handwriting using word matching
R. Manmatha, Chengfeng Han, E. M. Riseman, W. B. Croft
April 1996 **Proceedings of the first ACM international conference on Digital libraries**
Full text available: pdf(947.23 KB) Additional Information: full citation, references, citings, index terms

4 Automatic speech recognition for generalised time based media retrieval and indexing
John Robertson, Wai Yat Wong, Charles Chung, Dong Ki Kim
September 1998 **Proceedings of the sixth ACM international conference on Multimedia**
Full text available: pdf(684.96 KB) Additional Information: full citation, references, index terms

Keywords: approximate string matching, information retrieval, multimedia, speech recognition

5 A system for retrieving speech documents
Ulrike Glavitsch, Peter Schäuble
June 1992 **Proceedings of the 15th annual international ACM SIGIR conference on Research and development in information retrieval**

Full text available: pdf(941.62 KB) Additional Information: full citation, abstract, references, citings, index terms

An information retrieval model is presented for the retrieval of speech documents, i.e. audio recordings containing speech. The indexing vocabulary consists of indexing features that have the following characteristics. First, they are easy to recognize by speech recognition methods. Second, the number of different indexing features is small such that a reasonable amount of training data is sufficent to train the hidden Markov models that are used by the speech recognition process. Third, th ...

6 Document expansion for speech retrieval

Amit Singhal, Fernando Pereira

August 1999 **Proceedings of the 22nd annual international ACM SIGIR conference on Research and development in information retrieval**

Full text available: pdf(253.45 KB) Additional Information: full citation, references, citings, index terms

7 Cross-language speech retrieval: establishing a baseline performance

Páraic Sheridan, Martin Wechsler, Peter Schäuble

July 1997 **ACM SIGIR Forum , Proceedings of the 20th annual international ACM SIGIR conference on Research and development in information retrieval**, Volume 31 Issue SI

Full text available: pdf(1.82 MB) Additional Information: full citation, references, citings, index terms

8 Detecting topical events in digital video

Tanveer Syeda-Mahmood, S. Srinivasan

October 2000 **Proceedings of the eighth ACM international conference on Multimedia**

Full text available: pdf(1.04 MB) Additional Information: full citation, abstract, references, citings, index terms

The detection of events is essential to high-level semantic querying of video databases. It is also a very challenging problem requiring the detection and integration of evidence for an event available in multiple information modalities, such as audio, video and language. This paper focuses on the detection of specific types of events, namely, topic of discussion events that occur in classroom/lecture environments. Specifically, we present a query-driven approach to the detection of topic of ...

Keywords: multi-modal fusion, query-driven topic detection, slide detection, topic of discussion events, topical audio events

9 Vision: a digital video library

Wei Li, Susan Gauch, John Gauch, Kok Meng Pua

April 1996 **Proceedings of the first ACM international conference on Digital libraries**

Full text available: pdf(1.43 MB) Additional Information: full citation, references, citings, index terms

Keywords: content-based indexing and retrieving, digital libraries, video and audio processing

10 Towards robust features for classifying audio in the CueVideo system

Savitha Srinivasan, Dragutin Petkovic, Dulce Ponceleon

October 1999 **Proceedings of the seventh ACM international conference on Multimedia (Part 1)**

Full text available: pdf(867.70 KB) Additional Information: full citation, abstract, references, citings, index

terms

The role of audio in the context of multimedia applications involving video is becoming increasingly important. Many efforts in this area focus on audio data that contains some built-in semantic information structure such as in broadcast news, or focus on classification of audio that contains a single type of sound such as cleaar speech or clear music only. In the CueVideo system, we detect and classify audio that consists of mixed audio, i.e. combinations of speech and mus ...

Keywords: audio segmentation and classification, speech/music discrimination

11 Phonetic confusion matrix based spoken document retrieval

Savitha Srinivasan, Dragutin Petkovic

July 2000 **Proceedings of the 23rd annual international ACM SIGIR conference on Research and development in information retrieval**

Full text available: pdf(714.16 KB) Additional Information: full citation, abstract, references, citings, index terms

Combined word-based index and phonetic indexes have been used to improve the performance of spoken document retrieval systems primarily by addressing the out-of-vocabulary retrieval problem. However, a known problem with phonetic recognition is its limited accuracy in comparison with word level recognition. We propose a novel method for phonetic retrieval in the CueVideo system based on the probabilistic formulation of term weighting using phone confusion data in a Bayesian framework. We eval ...

12 FILOCHAT: handwritten notes provide access to recorded conversations

Steve Whittaker, Patrick Hyland, Myrtle Wiley

April 1994 **Proceedings of the SIGCHI conference on Human factors in computing systems: celebrating interdependence**

Full text available: pdf(848.13 KB) Additional Information: full citation, references, citings, index terms

Keywords: audio, handwriting, indexing, notes, retrieval, speech-as-data

13 Retrieval effectiveness of an ontology-based model for information selection

Latifur Khan, Dennis McLeod, Eduard Hovy

January 2004 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 13 Issue 1

Full text available: pdf(278.74 KB) Additional Information: full citation, abstract, index terms

Technology in the field of digital media generates huge amounts of nontextual information, audio, video, and images, along with more familiar textual information. The potential for exchange and retrieval of information is vast and daunting. The key problem in achieving efficient and user-friendly retrieval is the development of a search mechanism to guarantee delivery of minimal irrelevant information (high precision) while insuring relevant information is not overlooked (high recall). The tradi ...

Keywords: Audio, Metadata, Ontology, Precision, Recall, SQL

14 Information Retrieval and Text Mining: Advances in phonetic word spotting

Arnon Amir, Alon Efrat, Savitha Srinivasan

October 2001 **Proceedings of the tenth international conference on Information and knowledge management**

Full text available: pdf(561.11 KB) Additional Information: full citation, abstract, references, index terms

Phonetic speech retrieval is used to augment word based retrieval in spoken document retrieval systems, for in and out of vocabulary words. In this paper, we present a new

indexing and ranking scheme using metaphones and a Bayesian phonetic edit distance. We conduct an extensive set of experiments using a hundred hours of HUB4 data with ground truth transcript and twenty-four thousands query words. We show improvement of up to 15% in precision compare to results obtained speech recognition alone ...

15 New techniques for open-vocabulary spoken document retrieval

Martin Wechsler, Eugen Munteanu, Peter Schäuble

August 1998 **Proceedings of the 21st annual international ACM SIGIR conference on Research and development in information retrieval**

Full text available: pdf(204.51 KB) Additional Information: full citation, references, citings, index terms

16 NewsComm: a hand-held interface for interactive access to structured audio

Deb K. Roy, Chris Schmandt

April 1996 **Proceedings of the SIGCHI conference on Human factors in computing systems: common ground**

Full text available: pdf(1.24 MB) html(36.39 KB) Additional Information: full citation, references, citings, index terms

Keywords: audio interfaces, hand-held computers, structured audio

17 Retrieving and visualizing video

Boon-Lock Yeo, Minerva M. Yeung

December 1997 **Communications of the ACM**, Volume 40 Issue 12

Full text available: pdf(2.01 MB) Additional Information: full citation, references, citings, index terms

18 Video abstracting

Rainer Lienhart, Silvia Pfeiffer, Wolfgang Effelsberg

December 1997 **Communications of the ACM**, Volume 40 Issue 12

Full text available: pdf(2.51 MB) Additional Information: full citation, references, citings, index terms

19 SpeechSkimmer: a system for interactively skimming recorded speech

Barry Arons

March 1997 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 4 Issue 1

Full text available: pdf(1.03 MB) Additional Information: full citation, abstract, references, citings, index terms, review

Listening to a speech recording is much more difficult than visually scanning a document because of the transient and temporal nature of audio. Audio recordings capture the richness of speech, yet it is difficult to directly browse the stored information. This article describes techniques for structuring, filtering, and presenting recorded speech, allowing a user to navigate and interactively find information in the audio domain. This article describes the SpeechSkimmer system for interacti ...

Keywords: audio browsing, interactive listening, nonspeech audio, speech as data, speech skimming, speech user interfaces, time compression

20 Speech, Audio, Gesture: SCANMail: a voicemail interface that makes speech browsable, readable and searchable

Steve Whittaker, Julia Hirschberg, Brian Amento, Litza Stark, Michiel Bacchiani, Philip

Isenhour, Larry Stead, Gary Zamchick, Aaron Rosenberg
April 2002 **Proceedings of the SIGCHI conference on Human factors in computing systems: Changing our world, changing ourselves**

Full text available: pdf(540.75 KB) Additional Information: full citation, abstract, references, citings, index terms

Increasing amounts of public, corporate, and private speech data are now available on-line. These are limited in their usefulness, however, by the lack of tools to permit their browsing and search. The goal of our research is to provide tools to overcome the inherent difficulties of speech access, by supporting visual scanning, search, and information extraction. We describe a novel principle for the design of UIs to speech data: *What You See Is Almost What You Hear (WYSIAWYH)*. In *WYSI ...*

Keywords: *"speech as data", asynchronous communication, empirical evaluation, speech access, voicemail, what you see is almost what you hear*

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21 Key to effective video retrieval: effective cataloging and browsing
Dulce Ponceleon, Savitha Srinivasan, Arnon Amir, Dragutin Petkovic, Dan Diklic
September 1998 **Proceedings of the sixth ACM international conference on Multimedia**
Full text available: pdf(1.03 MB) Additional Information: full citation, references, citings, index terms

Keywords: cataloger, digital library creation, multiview storyboard, speech recognition, video annotation, video search and browse, video segmentation

22 Capturing, structuring, and representing ubiquitous audio
Debby Hindus, Chris Schmandt, Chris Horner
October 1993 **ACM Transactions on Information Systems (TOIS)**, Volume 11 Issue 4
Full text available: pdf(1.78 MB) Additional Information: full citation, abstract, references, citings, index terms

Although talking is an integral part of collaboration, there has been little computer support for acquiring and accessing the contents of conversations. Our approach has focused on ubiquitous audio, or the unobtrusive capture of speech interactions in everyday work environments. Speech recognition technology cannot yet transcribe fluent conversational speech, so the words themselves are not available for organizing the captured interactions. Instead, the structure of an int ...

Keywords: audio interactions, collaborative work, multimedia workstation software, semi-structured data, software telephony, stored speech, ubiquitous computing

23 Semantic speech editing
Steve Whittaker, Brian Amento
April 2004 **Proceedings of the 2004 conference on Human factors in computing systems**
Full text available: pdf(532.22 KB) Additional Information: full citation, abstract, references

Editing speech data is currently time-consuming and error-prone. Speech editors rely on acoustic waveform representations, which force users to repeatedly sample the underlying speech to identify words and phrases to edit. Instead we developed a semantic editor that reduces the need for extensive sampling by providing access to meaning. The editor shows a time-aligned errorful transcript produced by applying automatic speech recognition (ASR) to the original speech. Users visually scan the words ...

Keywords: acoustic representations, speech browsing, speech editing, speech recognition,

speech retrieval, transcripts

24 A multimodal learning interface for grounding spoken language in sensory perceptions

Chen Yu, Dana H. Ballard

July 2004 **ACM Transactions on Applied Perception (TAP)**, Volume 1 Issue 1

Full text available: pdf(1.73 MB) Additional Information: full citation, abstract, references, index terms

We present a multimodal interface that learns words from natural interactions with users. In light of studies of human language development, the learning system is trained in an unsupervised mode in which users perform everyday tasks while providing natural language descriptions of their behaviors. The system collects acoustic signals in concert with user-centric multisensory information from nonspeech modalities, such as user's perspective video, gaze positions, head directions, and hand moveme ...

Keywords: Multimodal learning, cognitive modeling, multimodal interaction

25 Speech and gaze: A multimodal learning interface for grounding spoken language in sensory perceptions

Chen Yu, Dana H. Ballard

November 2003 **Proceedings of the 5th international conference on Multimodal interfaces**

Full text available: pdf(849.56 KB) Additional Information: full citation, abstract, references, index terms

Most speech interfaces are based on natural language processing techniques that use pre-defined symbolic representations of word meanings and process only linguistic information. To understand and use language like their human counterparts in multimodal human-computer interaction, computers need to acquire spoken language and map it to other sensory perceptions. This paper presents a multimodal interface that learns to associate spoken language with perceptual features by being situated in users ...

Keywords: language acquisition, machine learning, multimodal integration

26 Associating cooking video with related textbook

Reiko Hamada, Ichiro Ide, Shuichi Sakai

November 2000 **Proceedings of the 2000 ACM workshops on Multimedia**

Full text available: pdf(1.03 MB) Additional Information: full citation, abstract, references, index terms

We have been handling video with supplementary documents, such as cooking programs, and are working on integration of such media. Through the integration, many applications will become possible, for example, reconstruction of multimedia data that supplement the information of each medium, construction of interactive database, or kitchen automation. Until now, we have proposed an integration system that perform integrative analysis of image, audio and text and associate each other. In this pap ...

27 Distributed design review in virtual environments

Mike Daily, Mike Howard, Jason Jerald, Craig Lee, Kevin Martin, Doug McInnes, Pete Tinker

September 2000 **Proceedings of the third international conference on Collaborative virtual environments**

Full text available: pdf(1.25 MB) Additional Information: full citation, abstract, references, citings, index terms

In large distributed corporations, distributed design review offers the potential for cost savings, reduced time to market, and improved efficiency. It also has the potential to improve the design process by enabling wider expertise to be incorporated in design reviews. This paper describes the integration of several components to enable distributed virtual design review in mixed multi-party, heterogeneous multi-site 2D and immersive 3D environments. The system provides higher layers of sup ...

Keywords: design review, global scale collaboration, multi-modal, spatialized audio, speech recognition, tele-conferencing, virtual environments

28 Associating video with related documents

Reiko Hamada, Ichiro Ide, Shuichi Sakai, Hidehiko Tanaka

October 1999 **Proceedings of the seventh ACM international conference on Multimedia (Part 2)**

Full text available: pdf(647.34 KB) Additional Information: full citation, references, citings, index terms

29 Document image understanding: Modeling content identification from document images

Takehiro Nakayama

October 1994 **Proceedings of the fourth conference on Applied natural language processing**

Full text available: pdf(555.79 KB) Publisher Site Additional Information: full citation, abstract, references

A new technique to locate content-representing words for a given document image using abstract representation of character shapes is described. A character shape code representation defined by the location of a character in a text line has been developed. Character shape code generation avoids the computational expense of conventional optical character recognition (OCR). Because character shape codes are an abstraction of standard character code (e.g., ASCII), the mapping is ambiguous. In this p ...

30 Speech-as-data technologies for personal information devices

Roger C. F. Tucker, Marianne Hickey, Nick Haddock

May 2003 **Personal and Ubiquitous Computing**, Volume 7 Issue 1

Full text available: pdf(312.92 KB) Additional Information: full citation, abstract, index terms

For small, portable devices, speech input has the advantages of low-cost and small hardware, can be used on the move or whilst the eyes & hands are busy, and is natural and quick. Rather than rely on imperfect speech recognition we propose that information entered as speech is kept as speech and suitable tools are provided to allow quick and easy access to the speech-as-data records. This paper summarises our work on the technologies needed for these tools – for organising, browsing, ...

Keywords: Audio summarisation, Speech compression, Speech recognition, Speech-as-data, Wordspotting

31 Automatic content-based retrieval of broadcast news

M. G. Brown, J. T. Foote, G. J. F. Jones, K. Sparck Jones, S. J. Young

January 1995 **Proceedings of the third ACM international conference on Multimedia**

Full text available: htm(51.60 KB) Additional Information: full citation, references, citings, index terms

Keywords: ATM, atm, browsing, content-based retrieval, information retrieval, multimedia, television news, text subtitles

32 ACM Multimedia '94 conference workshop on multimedia database management systems

Bruce Berra, Kingsley Nwosu, Bhavani Thuraisingham

March 1995 **ACM SIGMOD Record**, Volume 24 Issue 1

Full text available: pdf(257.39 KB) Additional Information: full citation, abstract, index terms

This paper describes the *ACM Multimedia '94 Conference Workshop on Multimedia Database Management Systems* held on 21 October 1994 in San Francisco, California. The workshop consisted of four sessions: designing multimedia database management systems, video and continuous media service, multimedia storage and retrieval management, and miscellaneous topics in multimedia data management. The workshop concluded with a discussion session on directions for multimedia database management. Twenty ...

33 SpeechSkimmer: interactively skimming recorded speech

Barry Arons

December 1993 **Proceedings of the 6th annual ACM symposium on User interface software and technology**

Full text available: pdf(1.13 MB) Additional Information: full citation, references, citings, index terms

Keywords: browsing, interactive listening, non-speech audio, speech as data, speech detection, speech skimming, speech user interfaces, time compression

34 Spoken dialogue technology: enabling the conversational user interface

March 2002 **ACM Computing Surveys (CSUR)**, Volume 34 Issue 1

Full text available: pdf(987.69 KB) Additional Information: full citation, abstract, references, citings, index terms, review

Spoken dialogue systems allow users to interact with computer-based applications such as databases and expert systems by using natural spoken language. The origins of spoken dialogue systems can be traced back to Artificial Intelligence research in the 1950s concerned with developing conversational interfaces. However, it is only within the last decade or so, with major advances in speech technology, that large-scale working systems have been developed and, in some cases, introduced into commerc ...

Keywords: Dialogue management, human computer interaction, language generation, language understanding, speech recognition, speech synthesis

35 String Match and Text Extraction: Improved string matching under noisy channel conditions

Kevyn Collins-Thompson, Charles Schweizer, Susan Dumais

October 2001 **Proceedings of the tenth international conference on Information and knowledge management**

Full text available: pdf(1.71 MB) Additional Information: full citation, abstract, references, index terms

Many document-based applications, including popular Web browsers, email viewers, and word processors, have a 'Find on this Page' feature that allows a user to find every occurrence of a given string in the document. If the document text being searched is derived from a noisy process such as optical character recognition (OCR), the effectiveness of typical string matching can be greatly reduced. This paper describes an enhanced string-matching algorithm for degraded text that improves recall, whi ...

Keywords: approximate string matching, information retrieval evaluation, noisy channel model, optical character recognition

36 Integrated multimedia messaging concepts and applications

Arturo Pizano, Tai-Yuan Hou

February 1996 **Proceedings of the 1996 ACM symposium on Applied Computing**

Full text available: pdf(641.36 KB) Additional Information: full citation, references, index terms

37 Report on the seventh ACM SIGOPS European workshop: systems support for worldwide applications

Andrew S. Tanenbaum

January 1997 **ACM SIGOPS Operating Systems Review**, Volume 31 Issue 1

Full text available: pdf(923.32 KB) Additional Information: full citation, index terms

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1 A phoneme probability display for individuals with hearing disabilities

Deb Roy, Alex Pentland

January 1998 **Proceedings of the third international ACM conference on Assistive technologies**

Full text available: txt(11.18 KB) Additional Information: full citation, references, citings, index terms

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